

## **TABLE OF CONTENTS**

1	SAFETY		Fuel System	3-4
			Compression	3-5
	INTRODUCTION	1-1	MECHANICAL PROBLEMS	3-6
	CLEANING, WAXING,		Leak Test	3-6
	AND POLISHING	1-1	Dynamometer Testing	3-6
	CONTROLLING CORROSION	1-2	Excessive Oil Consumption	3-7
	PROPELLERS	1-3	Engine Noises	3-7
	FUEL SYSTEM	1-8	ENGINE REMOVAL	3-8
	LOADING	1-10	General Information	3-8
	HORSEPOWER	1-11	Removal	3-8
	FLOTATION	1-11	ENGINE INSTALLATION	3-12
	EMERGENCY EQUIPMENT	1-13	INTAKE & EXHAUST MANIFOLDS	
	COMPASS	1-15	SINGLE OHC ENGINES	3-16
	POWER STEERING SYSTEM	1-18	INTAKE & EXHAUST MANIFOLDS	
	ANCHORS	1-18	DOHC ENGINES	3-17
	MISCELLANEOUS EQUIPMENT	1-18	HEAD SERVICE SINGLE OHC	3-23
	BOATING ACCIDENT REPORTS	1-19	HEAD SERVICE DOHC	3-24
	NAVIGATION	1-19	HEAD RECONDITIONING	3-28
			Valve Guides	3-30
2	TUNING		Valve Springs	3-30
			Valves	3-31
	INTRODUCTION	2-1	Valve Mechanism	3-32
	TUNING FOR PERFORMANCE	2-1	Hydraulic Lifters	3-32
	MECHANICAL TASKS	2-1	CAMSHAFT SERVICE SINGLE	
	IGNITION	2-5	OHC ENGINE	3-35
	FUEL SYSTEM	2-9	CAMSHAFT SERVICE DOHC	3-39
	Carburetor Adjustment	2-9	VALVE LASH ADJUSTMENT	
	Calibration for High Altitudes	2-10	SINGLE OHC ENGINE	3-43
			VALVE LASH ADJUSTMENT	
3	ENGINE		DOHC ENGINE	3-45
			TIMING BELT SERVICE	
	GENERAL PRINCIPLES	3-1	SINGLE OHC ENGINE	3-46
	Piston Stroke & Combustion	3-1	TIMING BELT SERVICE	
	Valve Timing	3-3	DOHC ENGINE	3-49
	Engines Covered	3-3	PISTON, RING, AND	
	Chapter Organization	3-3	ROD SERVICE	3-51
	TROUBLESHOOTING	3-3	Removal & Disassembling	3-52
	Cranking System	3-4	Cleaning & Inspecting	3-53
	Ignition System	3-4	Pistons and Pins	3-54

3	ENGINE (Continued)		Primary Circuit Test	5-4
	Piston Assembling	3-56	Contact Point Test	5-4
	Cylinder Bores	3-57	Condenser Test	5-5
	Rod Bolts & Nuts	3-58	Secondary Circuit Test	5-6
	Rings	3-58	Rotor Test	5-6
	All Blocks, Including DOHC	3-60	Ignition Voltage Tests	5-6
	CRANKSHAFT & MAIN BEARINGS	3-62	Spark Plug Evaluation	5-9
	Checking Main Brg. Clearance	3-63	BOSCH DISTRIBUTOR SERVICE	5-11
	Crankshaft Removal	3-66	Removal	5-13
	Cleaning	3-67	Disassembling	5-13
	Installation	3-68	Cleaning & Inspecting	5-15
	BELL HOUSING SERVICE	3-71	Assembling	5-16
	OIL PUMP SERVICE	3-72	Installation	5-20
	OLE I CIMI BERVIOL	J-12,	Adjusting Dwell	5-20
4	FUEL		Adjusting Ignition Timing	5-20
	TOLL		RENIX ELECTRONIC IGNITION	5-21
	INTRODUCTION	4-1	Description and Operation	5-21
	Single Diaphragm Fuel Pump	4-1	Checking Renix System	5-22
	Cold & Hot Engine Start System	4-1	Troubleshooting	5-23
	TROUBLESHOOTING	4-2	Troubleshooting	5-25
		4-2	6 ELECTRICAL	
	Rough Engine Idle	4-3	O ELECTRICAL	
	Excessive Fuel Consumption	4-3	INTRODUCTION	6-1
	Engine Surge FUEL LINE & FUEL PUMP TESTS	4-3 4-3	BATTERIES	6-1
				6-1
	Fuel Line Test	4-4	Marine Batteries	6-2
	Fuel Pump Testing	4-4	Battery Construction	6-2
	Fuel Pump Pressure Test	4-4	Battery Ratings	6-2
	Fuel Pump Volume Test	4-5	Battery Location	6-2
	VOLVO FUEL PUMP SERVICE	4-5	Battery Service	
	FUEL SYSTEM ACCESSORIES	4-6	Jumper Cables	6-5
	CARBURETORS	4-6	Storage	6-5
	Introduction	4-6	Dual Battery Installation	6-5
	"Sour" Fuel	4-7	GAUGES AND LIGHTS	6-7
	Carburetor Service	4-7	Constant Voltage System	6-7
	SOLEX DOWNDRAFT		Oil & Temperature Gauges	6-7
	CARBURETOR	4-7	Warning Lights	6-7
	Description and Operation	4-7	Thermomelt Sticks	6-8
	Removal	4-8	Fuel Gauges	6-8
	Disassembling	4-8	Fuel Gauge Hookup	6-9
	Cleaning & Inspecting	4-12	Fuel Gauge Troubleshooting	6-9
	Assembling	4-12	Tachometer	6-10
	Critical Plate & Gasket Words	4-18	HORNS	6-11
	Adjustments Single Carburetor	4-19	CHARGING SYSTEM	6-11
	Critical Idle & Mixture		Alternator Description	
	Adjustment Words	4-19	and Operation	6-12
5	IGNITION		Alternator Protection	
			During Service	6-13
	DESCRIPTION	5-1	Troubleshooting	6-13
	Ballast Resistor	5-2	SERVICE PRESTOLITE	
	Ignition Timing	5-2	CHARGING SYSTEM WITH	
	TROUBLESHOOTING	5-3	INTEGRAL REGULATOR	6-16
	System Tests	5-3	Disassembling	6-17
	General Tests	5-4	Cleaning & Testing	6-17
			5 5	

CRANKING SYSTEM	6-19	9 TILT/TRIM
Troubleshooting	6-19	
BOSCH CRANKING MOTOR	6-22	INTRODUCTION 9-1
Description and Operation	6-22	Tilt 9-1
Servicing	6-22	Trim 9-1
Disassembling	6-24	TROUBLESHOOTING 9-2
Cleaning & Inspecting	6-26	Tilt System 9-2
Assembling	6-27	Tilt/Trim System 9-3
Testing Completed Work	6-30	TILT SYSTEM SERVICE 9-4
Installation	6-30	Removal & Disassembling 9-4
		Cleaning & Inspecting 9-9
7 COOLING		Assembling & Installation 9-9
		TRIM SYSTEM SERVICE 9-13
DESCRIPTION	7-1	Removal & Disassembling 9-13
"RAW" WATER STRAINER	7-3	Cleaning & Inspecting 9-14
HEAT EXCHANGER	7-3	Assembling & Installation 9-15
Disassembling	7-5	TRIM SENDER SERVICE 9-16
Assembling	7-5	
"RAW" WATER PUMP	7-6	10 STEERING
THERMOSTAT	7-7	
OIL COOLER	7-8	DESCRIPTION 10-1
		SYSTEM MAINTENANCE 10-3
8 STERN DRIVE		SERVO VALVE ADJUSTMENT 10-3
6 SIERIA DRIVE		POWER STEERING COOLER 10-4
INTRODUCTION	8-1	POWER STEERING KIT 10-4
OPERATION	8-1	
TROUBLESHOOTING	8-2	11 MAINTENANCE
SERVICE PRECAUTIONS	8-3	***
PROPELLER SERVICE	8-3	IN-SEASON MAINTENANCE 11-1
Removal	8-3	OFF-SEASON STORAGE 11-5
Change Propeller Rotation	8-5	PRE-SEASON PREPARATION 11-8
Retaining Pawl Adjustment	8-5	ADJUSTING BOAT TRIM 11-10
Installation	8-6	ADJUSTING TRIM TAB 11-10
STERN DRIVE REMOVAL	8-8	FIBERGLASS HULLS 11-10
STERN DRIVE INSTALLATION	8-10	BELOW WATERLINE SERVICE 11-11
UPPER GEAR ASSEMBLY	8-12	A TOTALLY UTVERS
Disassembling	8-13	APPENDIX
Cleaning & Inspecting	8-19	METRIC CONVERSION CHART A-1
Assembling	8-21	DRILL SIZE CONVERSION CHART A-2
INTERMEDIATE HOUSING	8-36	TORQUE VALUES A-3
Disassembling	8-36	TUNE-UP ADJUSTMENTS A-4
Cleaning & Inspecting	8-41	ENGINE SPECIFICATIONS A-6 to A-17
Assembling	8-42	CARBURETOR SPECIFICATIONS A-18
LOWER UNIT	8-47	WIRING DIAGRAMS
Preparation	8-47	AQ131 & AQ230 (Model 230
Disassembling	8-48	& 250 A-19
Cleaning & Inspecting	8-52	Model 230 & 250 w/control panel
Assembling	8-54	layout No. 2 A-20
Shim Calculation	8-55	AQ171 (Model 251) DOHC
Checking "Backlash"	8-59	w/control panel layout No. 1 A-21
EXTENSIONS	8-62	Model 251 DOHC w/control
TRANSOM SHIFT D	8-69	nanel layout No. 9 A.99